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**Holmes**

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(54) **MEDICAL DEVICE FOR ANALYTE  
MONITORING AND DRUG DELIVERY**

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claimer.

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(52) **U.S. Cl.** ..... **435/7.1**

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422/68.1; 435/4, 6, 7.1, 287.1, 287.2, 286.1,  
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See application file for complete search history.

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(57) **ABSTRACT**

The invention relates to an ingestible, implantable or wear-  
able medical device comprising a microarray which com-  
prises a bioactive agent capable of interacting with a disease  
marker biological analyte; a reservoir which comprises at  
least one therapeutic agent and is capable of releasing the  
therapeutic agent(s) from the medical device; and a plurality  
of microchips comprising a microarray scanning device  
capable of obtaining physical parameter data of an interaction  
between the disease marker biological analyte with the bio-  
active agent; a biometric recognition device capable of com-  
paring the physical parameter data with an analyte interaction  
profile; optionally a therapeutic agent releasing device  
capable of controlling release of the therapeutic agent from  
the reservoirs; an interface device capable of facilitating com-  
munications between the microarray scanning device, bio-  
metric recognition device and the therapeutic agent releasing  
device; and an energy source to power the medical device.  
Specifically, the invention relates to a medical device capable  
of detecting an analyte in a bodily fluid comprising at least  
one microneedle capable of obtaining a sample of a bodily  
fluid, a first microchannel through which the sample flows  
and is in fluid communication with the at least one micron-  
needle, a second microchannel in fluid communication with  
the first microchannel, through which a buffer flows, wherein  
the second channel comprises a microarray with a bioactive  
agent, a microarray scanning device to detect an interaction  
between the bioactive agent and the analyte in the bodily  
fluid; and an interface device.

**32 Claims, 13 Drawing Sheets**